Volume 53, 1991

No. 1/2

SPECIAL ISSUE CONTENTS

Classics of Theoretical Biology

Epidemiology

ANDERSON, R. M. 3

Contributions to the mathematical theory of epidemics—I (by W. O. KERMACK and A. G. MCKENDRICK) 33

Contributions to the mathematical theory of epidemics—II. The problem of endemicity (by W. O. KERMACK and A. G. MCKENDRICK) 57

Contributions to the mathematical theory of epidemics—III. Further studies of the problem of endemicity (by W. O. KERMACK and A. G. MCKENDRICK) . . 89

Ecology

TOFT, C. A. and MANGEL, M.. 121

Random dispersal in theoretical populations (by J. G. SKELLAM) . . . 135

The trophic-dynamic aspect of ecology (by R. L. LINDEMAN) 167

Population studies: animal ecology and demography (by G. E. HUTCHINSON) . 193

Bioeconomics

REED, W. J. 217

The economic theory of a common-property resource: the fishery (by H. SCOTT GORDON) 231

Some aspects of the dynamics of populations important to the management of the commercial marine fisheries (by M. B. SCHAEFER) 253

The economics of exhaustible resources (by H. HOTELLING) 281

Book Reviews (G. NÉMETHY on *Proteins: A Theoretical Perspective of Dynamics, Structure and Thermodynamics (Advances in Chemical Physics, Vol. LXXI)* by C. L. BROOKS III, M. KARPLUS and B. MONTGOMERY PETTIT; M. CONRAD on *Computer Models of Mind: Computational Approaches in Theoretical Psychology* by M. A. BODEN; M. RUSE on *Evolution without Selection: Form and Function by Autoevolution* by A. LIMA-DE-FARIA; R. ROSEN on *Cognizers: Neural Networks and Machines that Think* by R. C. JOHNSON and C BROWN; R. ROSEN on *A Passion for Science* by L. WOLPERT and A. RICHARDS; G. B. ERMENTROUT on *Biological Delay Systems: Linear Stability Theory* by N. MACDONALD) . 313

Software Survey Section I

No. 3

JAFFE, S. Autocatalytic Membrane Conductance and Memory 327

LIAOFU LUO and HONG LI. The Statistical Correlation of Nucleotides in Protein-coding DNA Sequences 345

DERRIDA, B. and L. PELITI. Evolution in a Flat Fitness Landscape 355

THRON, C. D. The Secant Condition for Instability in Biochemical Feedback Control — I. The Role of Cooperativity and Saturability 383

THRON, C. D. The Secant Condition for Instability in Biochemical Feedback Control — II. Models with Upper Hessenberg Jacobian Matrices 403

HORVÁTH, G. and D. VARJÚ. On the Structure of the Aerial Visual Field of Aquatic Animals Distorted by Refraction 425

LIEBOVITCH, L. S. and T. I. TÓTH. Distributions of Activation Energy Barriers that Produce Stretched Exponential Probability Distributions for the Time Spent in each State of the Two State Reaction A⇌B 443

POZNANSKI, R. R. A Generalized Tapering Equivalent Cable Model for Dendritic Neurons 457

STADLER, B. M. R. and P. F. STADLER. Small Autocatalytic Reaction Networks — III. Monotone Growth Functions 469

Book Reviews. (M. KIMMEL and D. AXELROD on *Stem Cell Proliferation and Differentiation: A Multitype Branching Process Model* by C. A. MACKEN and A. S. PERELSON; G. B. ERMENTROUT on *An Introduction to Mathematical Physiology and Biology (Australian Mathematical Society Lecture Series, Vol. 4)* by J. MAZUMDAR; G. B. ERMENTROUT on *Chaotic Dynamics and Fractals* by M. F. BARNSLEY and S. G. DEMKO (eds) and *Dynamical Chaos* by M. V. BERRY, I. C. PERCIVAL and N. O. WEISS (eds); F. STEWART on *Mathematical Evolutionary Theory* by M. W. FELDMAN (ed.); K. W. HILU on *Plant Population Genetics, Breeding, and Genetic Resources* by A. H. D. BROWN, M. T. CLEGG, A. L. KAHLER and B. S. WEIR (eds); L. A. SEGEL on *Methods in Neuronal Modeling* by C. KOCH and I. SEGEV (eds); J. L. ARON on *Mathematical Approaches to Problems in Resource Management and Epidemiology* by C. CASTILLO-CHAVEZ, S. A. LEVIN and C. A. SHOEMAKER (eds); N. C. GILINSKY on *Dynamics of Dinosaurs and Other Extinct Giants* by R. MCNEILL ALEXANDER (ed.) . . 487

No. 4

NOWACK, W. J. and G. C. THEODORIDIS. The Thalamocortical Contribution to Epilepsy 505

SAXENA, V. P. and K. R. PARDASANI. Effect of Dermal Tumours on Temperature Distribution in Skin with Variable Blood Flow 525

AUMANN, Y. and H. PARNAS. Evaluation of the Time Course of Neurotransmitter Release from the Measured PSC and MPSC 537

SENO, H. Predator's Invasion into an Isolated Patch with Spatially Heterogeneous Prey Distribution 557

CARRIQUIRY, A. L., W. P. IRELAND, W. KLIEMANN and E. UEMURA. Statistical Evaluation of Dendritic Growth Models 579

CHARNICK, S. B., E. S. FISHER and D. A. LAUFFENBURGER. Computer Simulations of Cell – Target Encounter Including Biased Cell Motion Toward Targets: Single and Multiple Cell – Target Simulations in Two Dimensions 591

WEINBERGER, E. D. Spatial Stability Analysis of Eigen's Quasispecies Model and the Less than Five Membered Hypercycle under Global Population Regulation . 623

MICHELSON, S. and J. LEITH. Autocrine and Paracrine Growth Factors in Tumor Growth: A Mathematical Model 639

Book Reviews. (J. J. JEKA and J. A. S. KELSO on *Neuronal and Cellular Oscillators* by J. W. JACKLET (ed.); R. KAPRAL on *The Fractal Approach to Heterogeneous Chemistry: Surfaces, Colloids, Polymers* by D. AVNIR (ed.); W. TROY on *Handbook of Differential Equations* by D. ZWILLINGER; T. SAUER on *Dynamical Systems and Fractals: Computer Graphics Experiments in Pascal* by K.-H. BECKER and M. DÖRFLER) 657

No. 5

DÜNKI, R. M. The Estimation of the Kolmogorov Entropy from a Time Series and its Limitations when Performed on EEG 665

MCMORRIS, F. R. and R. C. POWERS. Consensus Weak Hierarchies . . . 679

CAZZADOR, L. Analysis of Oscillations in Yeast Continuous Cultures by a New Simplified Model 685

MAINI, P. K., M. R. MYERSCOUGH, K. H. WINTERS and J. D. MURRAY. Bifurcating Spatially Heterogeneous Solutions in a Chemotaxis Model for Biological Pattern Generation 701

FORD, R. M. and D. A. LAUFFENBURGER. Analysis of Chemotactic Bacterial Distributions in Population Migration Assays Using a Mathematical Model Applicable to Steep or Shallow Attractant Gradients 721

DAVIS, B. K. Variation in Polymer Fitness at Elevated Mutation Rates . . . 751

GLUNT, W., T. L. HAYDEN and W.-M. LIU. The Embedding Problem for Predistance Matrices 769

Book Reviews. (T. SAUER on *Practical Numerical Algorithms for Chaotic Systems* by T. S. PARKER and L. O. CHUA; P. RICHTER on *Information and Self-organization: A Macroscopic Approach to Complex Systems* by H. HAKEN; W. J. FLOYD on *Elements of Differentiable Dynamics and Bifurcation Theory* by D. RUELLE and *Chaotic Evolution and Strange Attractors* by D. RUELLE; B. STORRIE on *Receptor/Ligand Sorting Along the Endocytic Pathway* by J. L. LINDERMAN and D. A. LAUFFENBURGER) 797

No. 6

GETZ, W. M. A Neural Network for Processing Olfactory-like Stimuli 805

THOMAS, S. R. Effect of Varying Salt and Urea Permeabilities along Descending Limbs of Henle in a Model of the Renal Medullary Urine Concentrating Mechanism 825

ROSEN, G. Rook's Tour Representation of the Genetic Code 845

BALDING, D. J. and D. C. TORNEY. Statistical Analysis of DNA Fingerprint Data for Ordered Clone Physical Mapping of Human Chromosomes 853

LEWIS, M. A. and P. GRINDROD. One-way Blocks in Cardiac Tissue: A Mechanism for Propagation Failure in Purkinje Fibres 881

HSU, JYH-PING and TSUE-HWA CHEN. A Kinetic Analysis of the Germination of Fungal Spores 901

WU, J. and J. L. VANKAT. A System Dynamics Model of Island Biogeography . . 911

Book Reviews. (L. EDELSTEIN-KESHET on *Cell to Cell Signalling: From Experiments to Theoretical Models* by A. GOLDBETER; G. B. ERMENTROUT on *Perspectives of Nonlinear Dynamics* by E. A. JACKSON; J. R. GRIESEMER on *The Structure of Biological Theories* by P. THOMPSON) 941

Announcement 953